ROCKS and MINERALS

Official Journal of the Rocks and Minerals Association

A Magazine for Mineralogists, Geologists and Collectors

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ROCKS and MINERALS PEEKSKILL, N. Y., U. S. A.

The official Journal of the Rocks and Minerals Association

Chips From The Quarry

HARRY BERMAN MEMORIAL FUND

Dr. Harry Berman was one of the world's foremost mineralogists. And he belonged to our age. A quiet, unassuming, and a peaceful man he was admired, beloved, and respected by all who knew him personally. His tragic death on August 27, 1944, in an airplane crash in Scotland while on highly secret government war work, was a shock to all. He will always be remembered.

Dr. Berman's friends are legion and many of his closest ones have joined together in the wish to create something lasting and great in the field of mineralogy in his name. This would be the finest way in which to keep his name alive by making it possible for the same sort of work that he was doing so brilliantly to be carried on in his name and in his spirit into the far-distant future. It was decided that this could best be done by creating a new research laboratory in X-ray mineralogy.

Contributions to the Berman Memorial Fund will be welcomed from all who knew Dr. Berman, from all who knew and admired his work, and from all those generally who love mineralogy and would like to join in the creation of this worthy research project in mineralogy. A large sum of money has already *been* pledged to the Fund by a number of people.

The four trustees of the Fund are: Arnold Hoffman, Arthur Montgomery, Hazard Reeves (President of the Reeves Sound Laboratories where Dr. Berman did his most important war work), and Dr. Clifford Frondel, of the Harvard Mineralogical Dept., who is now head of research at Reeves.

Readers of *Rocks and Minerals* will be kept informed of latest developments in the Fund.

Special Article In This Issue

We wish to call our readers attention to a special article in this issue: "Collecting Overseas, Part 1 (Italy)," by Cpl. R. T. Howard, of the U. S. Army. Not only is this an intensely interesting article, and written by a member of the R. & M. A., but what is more important it was the result of a very happy meeting in Rome, Italy, between two members of the Association—an American soldier and an Italian mineral collector. How did they happen to meet? In the July, 1944, issue of *Rocks and Minerals,* we printed the name and address of the collector with a suggestion that American members stationed in Italy should try to meet him. Cpl. Howard tells how this took place.

So enthusiastic over the meeting is Cpl. Howard that in grateful thanks he has offered to prepare for us more articles on his collecting experiences overseas. Let us hope and pray that he may find the time to prepare these articles as we will be very glad to print them. We are sure he will be delighted to receive a card or letter of appreciation over his first article from all our readers who may care to write him.

For members stationed in Paris, France, we have a R. & M. A. member there from whom we have not heard in some time. Please look him up and if you are successful, let us hear from you. His name and address—General Louis Vesignie, 22 rue du General Foy, Paris VIII, France.

Attention Foreign Members

When making out money orders as payment for Association dues, please address them as follows: Rocks and Minerals Asso., Peekskill, Westchester County, N. Y., U. S. A.

Every year a number of money orders are addressed to New York City which is a cause of much confusion and annoyance before they can be cashed.

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MINERALS AND MILITARY STRATEGY

By J. C. BOYLE, Brooklyn, N. Y.

The outstanding importance of minerals in peace as well as in war is due to three considerations.

First, INDISPENSABILITY. Without steel, copper, manganese, lead, zinc, and many other such materials there can be no hope of a mechanized or industrialized economy. Minerals are the servants who do our work and any nation which is deficient in such materials can never be an efficient producer of goods for home consumption or for export.

Steel is the indispensable engineering and construction material—everything from a needle to a battleship requires the strength and durability or other qualities which we always associate with steel. Without copper the electrical age would suffer severe, almost crippling, handicaps for no other material which might take the place of copper would have but a fraction of its efficiency in the creation or distribution of electrical energy. To these must be added a long list of other mineral materials which furnish us with such things as abrasives, insulators, steel alloys, and hundreds of other things which serve us in the most unsuspected ways.

Second, N O N-REPRODUCIBILITY. An ounce of lead, used for white paint and finally removed by the effects of the weather, is lost forever. Minerals do not grow—a fact which gives them importance above living things, such as cattle, wheat, cotton, etc. They can not be displaced to any great extent by artificial substitutes, such as plastics. It is estimated by competent students of this phase of the matter that the total substitution possible would, at most, not exceed five percent. This is not surprising when we consider that it is really the different characters of the different atoms of materials that give them their widely different properties.

An atom of iron is like no other thing except another atom of the same metal—iron. It is totally different from an atom of copper and this difference in the atoms is shown in the differences in the qualities of the two metals. Whether artificial diamonds have ever been made is open to doubt, but if they ever are it will be done by using atoms of carbon—the same material that forms the diamond. And we shall probably never equal the supreme hardness of the diamond by the use of any other atoms,—at least, all such attempts have so far resulted in materials far inferior in hardness.

It might also be interesting to note that plastics are themselves frequently made of mineral materials. One type of synthetic rubber is made principally of salt and limestone. Generally, synthetics require mineral materials for their fabrication; such is the case with rayon and similar fibres, which require mineral acids and spinnarets of tantalum or platinum for their production.

Third, UNEQUAL DISTRIBUTION. There is an old saying among mining men that 'gold is where you find it'. It simply expresses the idea that we can not have minerals wherever we wish them; they are very unequally distributed throughout the world, and it is important to remember that NO NATION has

within its own land all the minerals necessary to create or maintain an industrial economy. A few figures as to the way in which some important minerals are scattered over the globe will help to make this clearer. These figures show the percentages of the world's minerals which are notably concentrated in large amounts in certain areas and where they are located:

Molybdenum—U.S.A.	92%
Nickel—Canada	83%
Aluminum—Germany	29%
Manganese—U. S. S. R.	45%
Tin—Burma & Malaya	70%
Tungsten—China	37,5%
Iron—U. S. A.	42.5%
Sheet Mica—India	77%

These are only a few, but the table serves to show the very unequal distribution of strategically important minerals among the nations of the world; the same is true of many others of strategic importance.

In times of *peace* the matter of unequal distribution is overcome by international trade, but even then, it should be emphasized, no nation which is short of iron in its own land can be an industrial factor of any importance in world trade. The other minerals required in the making of alloy steels, for instance, flow TO the IRON resources.

In times of WAR all three factors are increased in importance and the third—that of UNEQUAL DISTRIBUTION—becomes of prime importance in the overall strategy of war as the most important consideration then is to restrict, by every possible means, the minerals available to the enemy.

It is not generally understood what an important role has been played by minerals in the affairs of nations throughout all history. A few highlights of history, familiar to us all from school days, receive new meaning when viewed from this aspect.

Importance of Minerals in Ancient Times

When Greece destroyed the invasion of Xerxes, the Persian, by the great naval victory at Salamis in 480 B. C. she ended for over one thousand years the Asiatic threat to European civilization. Behind this victory stood the output of the great national mines of silver at Laurium, for it was the income from this enterprise that enabled Themistocles, the Athenian leader, to build the Greek fleet for a conflict he had long foreseen.

The Punic Wars, bitterly waged between Rome and Carthage for 118 years, revolved around a dispute over the silver mines of Spain and Sardinia. These mines were originally discovered by the Carthaginians as early as 900 B. C. and worked by them for centuries before the Romans began to expand beyond the Italian peninsuua. From them the great Carthaginian general, Hannibal, drew the sinews of war for the historic struggle which ended in 146 B. C. with the pitiless obliteration of the city of Carthage.

More recently, during the Spanish Civil War of 1935-38 the same Mines at Rio Tinto, Spain, then owned by British interests and worked for copper, figured prominently as pawns in that contest.

We have a letter written by the great Roman orator, Cicero, to a friend in 54 B.C. saying that Caesar was greatly disappointed in that, having crossed with his army into Britain, he "did not find a scrap of silver." Later, in working the lead mines of the Island, the Romans did secure some silver, but great amounts of lead were shipped to Rome and used to line the great system of aqueducts.

This chronicle could be continued through all history since then and would increase the understanding of the vital role of minerals in the lives of peoples and nations. But we must hurry along, and regretfully turning aside from a long series of interesting stories, we now bring into focus the present conflict and view it from the same standpoint.

At once we realize that the complete mechanization of armies means their complete 'mineralization', so to speak and that the maintainence of such armies calls for enormous increase in production by mines all over the world. It also means that these sources of materials become the most important objectives of strategy for both sides and that anything that cuts the production or the delivery of their

raw materials is bound to have the most far-reaching effects on the war-making ability of the contestants.

Minerals—their Strategic importance in the present war in Europe.

Now let us turn to the overall picture of the war in Europe and see how this matter of minerals has operated to create the pattern of the conflict.

In 1940 Hitler's armies moved swiftly into Belgium and France, seizing the outer rim of France and leaving 'Free France' to occupy the central portion. When it is realized that northern France contains the great bodies of iron ore which are close to the Ruhr coal basin in Germany and furnish it with raw material for steel-making and that the east of France is rich in aluminum ores, the meaning of this strategy becomes brilliantly clear. With her resources of these essential metals in enemy hands, France was out of the war and no effective opposition was possible.

Further, the position of Germany in the matter of iron ores before this was only fair, but she was on the way to *developing* large deposits of a poorer grade in the centre of the country. This military stroke, however, gave her at once mastery over a steel output considerably beyond that of England whose ores are not so large nor so rich as they once were.

A glance at the percentages of steel production for the important nations of the world will clearly demonstrate the meaning of this German move. For 1938 these figures are very close to exact; (Six nations produced 86% of the world output).

United States	27%
Germany	22%
U. S. S. R.	17%
England	10%
France	5%
Japan	5%

The next major move by Germany was the assault on the Soviet Union, especially concentrated on the Ukraine and Southern Russia. It was widely spoken of a drive for the vast wheat acreage of the Ukraine; competent agricultural authorities failed to clarify the situation by saying that the food of the Ukraine was not necessary to Germany. What, then, was the objective?

The answer is to be found in Manganese, that metal without which it is impossible to even start the making of good steel, the metal in which Germany and ourselves are notably lacking. Our supplies of this metal have for long years come from the Ukraine, Brazil, and India. When war came we were compelled to fall back on Brazil as our chief source of supply, to secure which we also had to beat the German submarine menace.

What would be more natural then than that Germany should try to make sure of her steel production by seizure of the nearest source of this vital material? With it she also took the best and largest deposits of iron in the Soviet *Union* along with great beds of good coal, located in the same area. With the seizure of the Caucasus area, Germany added petroleum resources to her war machine —there being no petroleum in her own land. She has, however, enormous facilities for making synthetic gasoline from extensive low grade coal deposits.

Thus, as Germany pushed her boundaries east and west, she did so in such a way as to secure the greatest possible amount of strategic minerals. While it is true that she seized other areas, these were taken as military defenses for the seized mineralized areas.

In France, Belgium, and Poland she added lead and zinc to her store; in Greece, magnesium for planes and emery for abrasives; in Italy she controlled aluminum ore and mercury, the latter being a most important material for fuses for shells of all kinds. In Norway molybdenum served her needs well as it is a very valuable agent for toughening steel for such things as tank-treads; in Finland (at Petsamo, recently captured by Russia) the nickel mines, though small, furnished a supply of one of the best of all steel-hardeners used for making armor and guns, and familiar to us as stainless steel.

In Turkey, diplomacy got her large supplies of chromium, the other indispensable ingredient of stainless steel.

From the 'friendly' nations of Spain and Portugal she secured large supplies of tungsten, the indispensable item in modern high-speed tools for the rapid shaping and finishing of all sorts of hard metals. From Spain came also large supplies of mercury, while from Sweden she obtained large quantities of the finest grade of iron ore. Strangely, too, this ore contains a very small percent of vanadium, that great steel toughener which Germany lacks. By a very clever process, German scientists learned to remove this little 'stow-away' and saved an embarassing situation.

If now we look back at the Germany of 1942-43, holding all these resources in her grasp, it is easy to see why our offensives, both military and diplomatic, have taken their form.

We no longer wonder at the diplomatic and business moves made against Spain, Turkey and Sweden; we can understand now the destruction of the seemingly harmless little village in Norway that clustered about the molybdenum mine there; of the repeated bombing of the little village of Petsamo by England; we can see the necessity for driving Rommel from Africa to clear the way for Turkish chromium, five shiploads of which lay in the harbor of Alexandria, waiting to come to the U.S.A. where it was badly needed.

When we think of the meaning of the loss of the Ukraine to the Soviet, we can see also why the Soviet probably could not have survived without our billions of dollars worth of equipment—made absolutely necessary by the German seizure of the great resources of manganese and iron.

Finally, aside from other considerations as to the location of our landings in France, we can see they had a prime importance in the objective of rescuing the iron of northern France along with the coal and other minerals of that part of Europe—all of the most vital importance to Germany.

In summing up, we see a picture of important—nay, even vital, minerals scattered over Europe. On top of this we lay the map of the principal operations of the war and we no longer ask —"Why?" The minerals themselves furnish the key to the overall strategy on both sides of the conflict.

Thus we realize that mineral wealth is truly wealth in every sense of the word —a wealth in which the intelligent citizen of the future will, by force of circumstances, have a much more lively interest—a much more real concern.

Fine Stilbites from Moore Sta., New Jersey

Some of the finest stilbites known to occur in the United States have been found in the trap rock (basalt) quarry at Moore Station, of western New Jersey. The mineral occurs in sheaf-like groups of beautiful brown crystals, generally associated with colorless crystals of calcite.

The quarry is abandoned and though some blasted rock still remains, only fragments of the beautiful stilbite can now be found.

Moore Station is a small hamlet in northwestern Mercer County and on the Delaware River.

World's Largest Asphalt-Rock Deposit

In a canyon near Sunnyside canyon, Utah, where Henry Kaiser has one of his coal mines, there is an eight million ton deposit of natural rock-asphalt, covered with three to fifty feet of soil and waste rock. The seam is 1,300 ft. wide and extends 17 miles up the canyon.

Millions of years ago there was a trapped accumulation of asphalt base oil, which mixed with fine grained marine silica sand. Pressure and heat volatilized the lighter fraction of the oil, which probably dispersed or migrated, leaving the residual oil in the sands. Later, the asphalt-sand combination was pressed by nature into a hard rock. Quarrying operations have been carried on for some years. In fact, the Chicago World's Fair grounds were paved with this bituminous rock.

A specimen would be interesting in any mineral collection—not for beauty but for its geological formation.

COLLECTING OVERSEAS, Part I (Italy)

By CPL. R. T. HOWARD, 5th Ord. Co., (MM), APO 386
c/o Postmaster, New York, N. Y.

Ever since I received my copy of *Rocks and Minerals* (July, 1944), with Mr. Palumbo's address, I have been anxiously awaiting an opportunity to visit with him.[1]

My chance came on the first of November. I was given a three day pass which ultimately turned into a 14-day furlough. The only air transportation available was to Florence; after spending 3 days there (a very picturesque city, too), I flew to Naples. I could hardly rush off without visiting Mt. Somma and Vesuvius. Mt. Somma is called the old Vesuvius and it is here that most of the prize speciments are found. Since my time was somewhat limited, I was forced to make a choice. Its been a life long ambition of mine to climb an active volcano so I chose Vesuvius.

Normally there is a tram operated by Cook's Tours that takes the tourists up to within a few hundred feet of the crater's edge. However since the March eruption it only operates 1/3 of the way, and we were forced to walk the rest which I might add was quite a hike.

I started with a group of tourists, all service men, but soon lost them in my anxiety to look for minerals.

The lava was still hot from the March eruptions, not just warm but hot. It was quite an experience being on the side of that famous volcano and gazing at the live steam, escaping from fissures all about you. At these fissures there were small deposits of amorphous Sulpher of which I gathered a small vial full. There was not much to be found in the way of minerals except for some Biotite and several different samples of Leucite Phenocrysts in lava, also lava with minute crystals of Nephelite. Perhaps I was on the wrong side, nevertheless it was quite a thrill to stand on the brink of the crater and look down at the steaming mass, which was approximately 400 feet below. The diameter was about a half mile and the circumference is perhaps a mile or better, the height is in the neighborhood of 4,500 feet. If I ever have the opportunity again, I'll visit Mt. Somma for sure.

The next morning found me on my way to Rome. It was six days before that I had set out for the "Eternal City" and my enthusiasm had increased with each day.

I Meet Mr. Palumbo

My second day there and I was off in search of Corso Trieste, which is where Mr. Palumbo lives. When I arrived he was out so I waited till 5 o'clock, at which time I was told that Mr. Palumbo was dismounting from his motorcycle in front of the apartment. The motorcycle is his and Mrs. Palumbo's means of transportation, and very practical, too, for over here.

After collecting for 2 years all over N. Africa and the Mediterranean Islands with no one but myself, I was pretty anxious to meet and talk to someone with the same interests so running out front with the issue of R & M in one hand, and waving the other, mutilating terribly the Italian language (having forgotten for the moment that Mr. Palumbo speaks English), I introduced myself.

He was overjoyed with Mr. Zodac's thoughtfulness in printing his name and address. After being introduced to his wife and a friend, we went up to his apartment which was beautiful. I say this not only because it is true but for anyone not having seen their own home for over 2 years and living the way we do in the field, being entertained in any home is a treat. But one like Mr. and Mrs. Palumbo's is something not easily forgotten. Mrs. Palumbo brought out some of their best wine from their own vineyards. Now, I'm no connoisser but having tasted a good many wines since being overseas, I have a fair idea of the better types, and this was excellent.

I was anxious to see his collection and

[1]Mr. Roberto Palumbo, mineral collector, residing in Rome, Italy, and a member of the R. & M. A.

he cheerfully obliged. On entering the room that houses the largest part of it, I was speechless, except for a continual Oh!, Ah! or M-M-M. . .as any collector might do on viewing specimens that up until that moment, he had only read about. Needless to say, his collection puts mine to shame but he has been at it since he was 11 years of age, so I'd say he had a slight edge on me.

There wasn't time for me to see everything at that time so I returned the following day. When I did, Mr. Palumbo had about 40 choice specimens laid out on his desk which he generously gave me. You can well imagine how much they mean to me, obtaining them as I did. Added to my collection they will have quite a story to tell and some very pleasant memories.

Next, Mr. Palumbo and I planned a trip to Albano Hill, a famous locality for Lapis lazuli, Leucite, Vesuvianite etc. (an article on the geology and minerals of this locality is under preparation.)

Albano Hills Visited

The following day I met Mr. and Mrs. Palumbo *and* their motorcycle at the Piazza, Bologna, and we proceeded to the town of Albano. It was about an hour's ride from Rome. Back in the States we would have been stared at. I guess it did look a little comical, Mr. P. driving and Mrs. P. in the sidecar and a G.I. in the back, but over here it is very appropos. It was very cold and riding in an open vehicle didn't help much. We stopped at a cafe for a bottle of wine and with it we had an Italian dish Mrs. P. had prepared. It was tasty but new to me and I'm afraid I made a poor showing. We arrived at the town of Albano, where we had to obtain permission to go hunting in the quarry and adjacent fields. The American authorities would not let us venture into the fields because of mines and booby traps which was quite all right with us. I was very glad they were able to warn us. They said the quarry was alright to visit as all there was there were Nazi hand grenades and mortar shells. I thought to myself. . .Oh fine. . . that's just dandy. Here I have my first pass in two years. . .just wanted to do a little peaceful collecting and what happens. . .I run into live Jerry ammunition and grenades!

We had to go around the hill to get to the quarry, as the Germans had blown up the beautiful and ancient bridge of Albano (about 200 years old) connecting Albano with the main Rome highway. This is a usual proceedure of theirs in retreat, *if* they have enough time.

The quarry has not been worked since the start of the war, so there were no new diggings to rummage through. After much by-passing of ammunition we managed to find a few choice pieces of Lapis lazuli, Hauynite, Phillipsite, and some good crystals of Biotite, Leucite, Vesuvianite and the rare mineral Cuspidine. Our trip was very successful.

There was a large German Field piece (about the size of our Long Tom) dug in, that had its breech and muzzle blown up so it could not be used against them. I wanted to get a picture of the area for R. & M. but in my haste I forgot the camera. The censor would have not allowed it anyway.

We spent the better part of the afternoon there and then went to Mr. Palumbo's farm, or what used to be a farm. It is situated just two miles from Anzio. At the time of the Anzio Beachhead the Germans had an Artillery piece right alongside of the house. The firing that followed the landing ripped the house apart at the seams and corners. When we returned the fire it was shot up pretty bad. It's a shame but as the French say, c'est Le Guerre! They also had used the house as a small field hospital and sure mutilated the walls and furniture.

Royal University of Rome Visited

The following day Mr. P. took me and one of my buddies, Sgt. King, to visit the Royal University of Rome. I am gradually trying to convert Sgt. King from Archeology to Mineralogy. I *know* we have some modern and up-to-date schools in the States, having attended Bucknell and Columbia University, but this school seems to have been designed 20 years ahead.

Our main interests was in the School of Mineralogy and its collection. We were introduced to Prof. Embertto, who is head of the department and a good friend of Mr. Palumbo. The Professor was good enough to leave his class and show us some of the outstanding specimens. At several of the beautiful arrayed cases he stopped, unlocked one and then extracting two choice crystals of black garnet presented one each to King and to me. Next, he gave us a piece of Dendrite on Smithsonite, a beautiful specimen. You can again imagine how much I value these additions for my collection for the most extraordinary way they came into my possession. We concluded the day by taking pictures of us all in the Museum.

To say that my three day pass was very successful would be a gross understatement. It developed into two weeks that I shall never forget.

EDITOR'S NOTE: Cpl. Howard, your efforts have been successful. Sgt. King has not only been converted to mineralogy but he is also a full-fledged member of the R. & M. A. and a most enthusiastic one, too. Why he may even write an article for us before long!

HENRY W. NICHOLS RETIRES

After more than fifty years of service on the staff of the Chicago Natural History Museum, Henry W. Nichols, chief curator of the department of geology, is retiring as of December 31, due to ill health.

Mr. Nichols, who is in his seventy-eighth year, joined the staff in 1894 as curator of economic geology. From 1897 to 1921 Mr. Nichols was assistant curator of geology; from 1921 to 1933, associate curator; from 1933 to 1936 curator of geology; and from 1936 on he has been chief curator. He has conducted sixteen expeditions in North and South America for the museum, collecting a wide variety of geological material now to be seen in the five huge exhibition halls of his department.

Mr. Nichols is the writer of many papers in his field of science, some of a technical nature, and some for lay readers. He is a graduate of Massachusetts Institute of Technology, class of 1893, and was a member of the faculty there briefly before coming to the museum.

Although long since eligible for retirement, and in frail health for the past several years, Mr. Nichols remained at the museum feeling that in the present manpower shortage it was his patriotic duty to do so. His department since Pearl Harbor has been one of the hardest hit in the institution in losing younger members of its staff to war service. Four of the normal quota of five male assistants in his department are now in the Army and Navy, and he and one other man, Dr. Paul O. McGrew, assistant curator of paleantology, have been carrying the full burden of the department's activities.

Dr. McGrew has been appointed acting chief curator of the department.

Antamokite from the Philippines

Antamokite is a telluride of gold with some silver. It is grayish-white in color, with a tinge of blue. It occurs in the gold mines of Antamok, Mountain Province of western Luzon Island, Philippines, where it is associated with calaverite, chalcopyrite, quartz, and tetrahedrite.

Antamok is about 7 miles southwest in Baguio. The mineral received its name from the locality.

Beautiful Octahedrites found in Switzerland

Octahedrite (also known as anatase) is an oxide of titanium and beautiful, transparent, brownish crystals in mica schist occur at Selva, Switzerland. Some of the larger crystals fom this locality have been cut for gems, although it is a soft stone (H $5\frac{1}{2}$).

Selva (5,000 ft above sea level) is a village in the extreme western part of Canton Grisons, in the eastern part of Switzerland.

REPORT ON TWO MAINE MINES

By CHARLES F. MARBLE, Buckfield, Maine
PHILIP MORRILL, Windham, N. H.

Black Mt. Mica Mine

A new Federal road, reputedly costing $15,000, has been built to the Mica Mine, Black Mt., Rumford, Maine. The entrance to this road is east of the old road to the mine.

It is possible at present to drive a car to the mine but the last two hundred yards is steep and loose gravel, so it is suggested that the car be left at the turnout a couple hundred yards from the mine. It may be that the heavy trucking that will go over this road in the future will rut it to a depth that the ordinary passenger car will not clear.

The road brings one up to the level of the floor of the newer workings and above the old dump. In the pit directly at the end of the road will be seen a pile of waste, mostly spar from the level above.

The writers obtained several specimens of eosphorite from this pile. These run smaller crystals than the earlier eosphorites, being groups of minute cactus-like crystals in vugs, usually yellow to brown in color. One specimen of good crystals of manganocolumbite was found. These have a distinct reddish color in contrast to the steely black of columbite. Large quantities of spodumene may be found which may be the remains of the large crystal that for years was conspicuous at the end of this pit. One specimen of fairfieldite was found which consisted of white botryoidal fillings in vugs. A small amount of lithiophylite, lepidolite and tourmaline is also found.

On the level above are several small openings. The nearest shows considerable amblygonite, a little white beryl and two yellow jacket nests. We suggest that it would not be wise to attempt to collect the last. The openings above show muscovite but mostly in scrap grade and very little book or plate mica.

The level below the road shows the most amazing display of lepidolite known. It is fine grained and can be turned in a lathe as a piece of steel. The color is deep lilac. Tons are laying on the bottom and the quarry face shows a solid uniform mass 12x18 feet and extending back to unknown depths.

It is of interest that this lepidolite carries as high as 2% caesium oxide and ½ gallium oxide. Thus aside from being a magnificent building and ornamental stone, there is a distinct possibility in its use as an ore of the above metals and lithium. The huge fans of tourmalines from this locality seems about exhausted. No quantity is in sight on the face but a small amount of inferior stuff can be dug from the dump. A small amount may be exposed as the lepidolite is worked. These tourmalines contain 1% gallium oxide. There is still a large amount of tourmalinated granite available.

The old dump north of the opening probably contains some good sized eosphorites and gemmy tourmalines. The lowest dump showed up with two pieces of rose colored spodumene but not of cutting grade. In the past we have obtained kunzite of gem quality here.

In general, cassiterite and columbite may be found in small crystals and masses. Beryl, amblygonite and spodumene are fairly uniformly distributed over all these workings. Manganese stains and ores are to be found in a number of places.

No permit is required for this mine as it is not being worked at present. As soon as labor is available, it will be reopened and permits will be required from the West Paris feldspar mill, West Paris, Maine.

Future work on this quarry is intriguing as it seems almost anything on the pegmatite list of minerals may show up It is almost like reaching into a grab bag.

Newry Mine, Plumbago Mt., Newry Maine

This mine is seeing extensive operations and considerable material has been removed. It is necessary to obtain a permit from the West Paris mill as above. It is impossible to drive a car up the present road and it should be left off the tar road below.

At present at the foot of the hill is a pile of mixed white beryl, spodumene, amblygonite. The white beryl has a glassy partly transparent and translucent appearance, while the amblygonite is duller in texture and a uniform white. The spodumene is white with the best cleavage and the well-known fibrous appearance.

The present workings are about three-fourths the way up the hill to the original workings famous for the tourmaline. A fair sized pit has been opened and two tunnels started into the side of the hill from the bottom of the pit. At present two tunnels 30x30x20 feet high separated by a wall of pegmatite are being worked. The roof is heavily micaed giving safety. The tunnels can follow the best spar with minimum waste and are cooler in summer and snow free in winter. Pillars will be left at thirty-foot intervals to support the roof.

Work is done alternately in these tunnels. At the time of our visit the right hand tunnel was active. Therefore most of our work was done in the left hand tunnel. Access was given us through the courtesy of Mr. Ross, the superintendent of the mine. Triphylite is abundant and numerous crystals are found. Most of this is dark brown, friable, and intergrown with mica. Weathering produces a bright blue coating of vivianite and farther weathering turns the mass to a brown ferrisicklerite. Graftonite was not found but specimens showed a lamellar structure similar to the structure of this mineral. One of the operators had a triphylite crystal about eight inches long.

The bottom of the quarry is largely quartz and amblygonite. We were fortunate enough to break into a pocket in the amblygonite and secured four specimens of terminated crystals. These are white and more or less transparent. Tons of massive amblygonite are in sight. On the side walls are noted large crystals of spodumene. These are white to greenish white and in a few places show alteration. At other places large masses of sphalerite show. A lot has been removed and two pieces weight fourteen and ten pounds. The sphalerite is full of small crystals of columbite. White beryl shows here but most of the beryl removed is from such large crystals that no faces were evident. This is filled with spots water clear and of gem quality. Mostly, they appeared to be too small to cut but the possibilities of good sized goshenite should not be overlooked. We obtained several specimens of fairfieldite. Cassiterite is present mostly in small spots although one chunk weighed several ounces. One specimen shows tetragonal pyramids of brown zircon? Rose quartz is rare and rose quartz crystals are not as common as previously. Beautiful emerald green amazonite was taken from this opening.

The right hand tunnel produced a columbite crystal three feet long. We have two specimens from this about six or eight inches square and an inch thick. The combined weight is ten pounds.

Spodumene, amblygonite and triphylite seem to hold all the lithium and very little lepidolite and tourmaline are found.

A collector never leaves these mines without a full pack.

Trilobites from Getz Quarry, Penn.

The Noah Getz quarry is located 1 mile north of Rohrestown in western Lancaster County, of S. E. Pennsylvania (Rohrestown is 2½ miles northwest from the city of Lancaster). In the shale of this quarry very fine trilobites have been found, in fact the Getz quarry (on Noah Getz farm) is a noted locality for these fossils. As the trilobites are abundant, the quarry has been much visited by collectors and many specimens taken to enrich museums and private collections.

A MONTANA CORUNDUM MINE

By H. E. MURDOCK
Bozeman, Mont.

The most important corundum deposit in Montana is that formerly operated by the Montana Corundum Company located about 23 miles nearly due south of Belgrade, in the southwestern part of the state.

History

About 1901 or 1902, Mr. Harris Kirk found corundum on his ranch and sent samples to Belgrade from whence they were forwarded to Mr. L. S. Ropes, a developer of corundum properties. At that time Mr. Ropes was in an eastern state on a corundum project, but he soon arrived in Montana to investigate the new deposit on the Kirk ranch. The deposit looked so promising that he helped organize the Montana Corundum Company, and he also operated the mine. The Montana Corundum Company was organi ed between the years 1902-1906, to mine and mill the abrasive corundum found on the ranch of Harris Kirk. The directors of the company were Harris Kirk, A. L. Love, and E. A. Stiefel. Capitalization $100,000.

Location of Mine

The corundum deposit is located on a ridge of the foothills of the Spanish Peaks about 25 miles southwest of Bozeman, a small city, and some 10 miles southwest of Gallatin Gateway (formerly known as Salesville). Gallatin Gateway is in the western part of Gallatin County, in southwestern Montana.

Geology[1]

The deposit is in the famous corundum area of Gallatin County where two other mines, operated by the Bozeman Corundum Co. and by the Anceny Corundum Co., are located. The corundum occurs in two types of rock—a corundum syenite is one and a corundum pegmatite the other.

The corundum syenite is the prevalent type and is the one present on the Montana Corundum Co. property. It has a gneissoid structure, dark gray color, and the corundum in it varies from grains up to good size crystals (some up to 8 inches in length). The syenite is very largely feldspathic (flesh-colored orthoclase chiefly) with a small quantity of bronzy-black biotite. The corundum is bluish in color, in well formed crystals, though it is also present in grains of a paler color.

Layout

Some open pit work was done at the top of the ridge and a shaft 60 feet deep was sunk. A concentrating mill was built on the creek about ½ mile down the slope to the west. The ore was crushed and graded in sizes from 14 to 200 mesh and shipped east to a number of abrasive companies including the Pike Company at Stamford, Conn.

Mine Abandoned

Work continued for three years until the ore-bearing rock played out in the shaft and competition from electrically manufactured silicon carbide, carborundum, etc., made it unprofitable to ship corundum to the east. The mine was then abandoned.

The mill, machinery, etc., were sold at a sheriff's sale about 1914 to the Childs-Anceny or the Flying D Ranch, commonly known as the Anceny Ranch.

The Anceny Ranch also secured title to the mine property and to the Kirk Ranch as well. The old red stone house (ranch house on the Kirk property) still stands, a ¼ mile be'ow and to the south of the old corundum diggings.

Mr. Kirk personally lost $25,000 in the enterprise as the mine was not a success.

The property has not been altogether forgotten as Mr. Ropes is back again and this time is investigating the old Kirk mine for the Government.

I have made several trips to the locality and a litt'e over a year ago I

(*Continued on page* 63)

[1] *Corundum, its occurrence, distribution, exploitation, and uses:* By Alfred Ernest Barlow. Geological Survey, No. 50, Ottawa, Canada (1915), P. 213

ONE DAY MINERALOGICAL JAUNTS

By PETER ZODAC

1. A trip to Binghamton, N. Y.

On Sunday, Oct. 6, 1940, in the good old days when auto traveling was in its glory, a trip was made to Binghamton, N. Y., just to see what could be found in the mineral line along the way. Ken Pugsley, of Pawling, N. Y. (now in the armed service of our country), and the writer made the trip. We left Peekskill at 7:30 a.m., crossed the Hudson River via the Bear Mountain Bridge and headed northwest, over U. S. Route 6, to Monroe where we turned off on N. Y. Route 17 and followed it all the way to Binghamton. The speedometer was set at 0.00 when we started so all readings given are from Peekskill, N. Y.

Our first stop was made ½ mile past Bridgeville (62.0 miles), a little hamlet in Sullivan County. Here along the right edge of the road, on an upgrade, was a very nice exposure of red sandstone which we stopped to examine. The outcrop was 200 feet long and 10 feet high but unfortunately no minerals were found in it.

Delaware County was entered at 96.4 miles.

The next stop (105.8 miles) was at a huge glacial drift deposit bordering the right edge of the road—Beaver Kill, a small stream, was 50 feet to left. The drift contained many huge boulders of red and gray sandstone. Three minerals were found here as follows: *anthracite,* small black incrustations on boulders, *limonite,* small brown earthy masses in boulders; and small masses of *pyrite* in boulders.

Our route, thus far, went through a number of noted summer resorts in southeasten New York but their "beauty" was so uninteresting that we actually put on the gas to pass through them quickly.

Peakville (108.3 miles) is a little hamlet in Delaware County interesting to the writer only because its name is often confused with Peekskill. Many letters addressed to ROCKS AND MINERALS are received each year bearing an extra postmark reading "Missent to Peakville, N. Y." Were it a week day we would have stopped at the post office to see the postmaster and to thank him personally for forwarding to us the many letters that had been sent by mistake to his office.

From Peakville to Deposit we were in a sandstone country and many quarries could be seen often high up on the mountain sides. These quarries are all abandoned as their product was used chiefly for curbing, sidewalks, etc., which have been superseded by concrete. As sandstone quarries in southeastern New York are not known for minerals we made no attempt to visit them as they were way off the road.

At the very southern limit of the village of Deposit, opposite the Town Line, a quarry is only 200 feet to the right of the road and we stopped to look it over. It was about 300 feet long, 150 feet wide and 100 feet high at the face and about 100 feet above the road. We learned from a nearby resident that it was the Wheeler Sandstone Quarry and had been abandoned for 8 years. The rock was a red and a gray horizontally bedded sandstone and many huge sawed slabs were piled up here and there. We found four minerals: *aragonite,* grayish incrustations on sandstone; *anthracite*, lustrous black thin masses replacing fossil plants in the sandstone; *limonite*, common as yellowish stains on sandstone; and *opal (hyalite)*, grayish incrustations on gray sandstone.

Deposit (136.8 miles) is in southeastern Broome County but so close to the Delaware Line that some maps actually show it in Delaware County.

We reached Binghamton (170 miles) about noon without making any more stops. It is a beautiful city of 80,000 population with many handsome stores and buildings. We reached Binghamton much sooner than we expected, and since our trip thus far was not very suc-

cessful from a mineral angle we decided to return home by another route. So we took N. Y. Route 7, heading for Oneonta to the northeast.

A dark gray slate exposure bordering the right edge of the road (177.5 miles) caught our eye and we stopped to examine it. It extended for 300 feet and was 25 feet high but not a single mineral could be found except some brown limonite stains. About ½ mile further on we noticed a huge gravel bank off the road to the right but we did not stop to examine it. Both these localities are in Broome County.

At 194.0 miles Chenango County line was passed but no outcrops were visible. Approaching Afton (199.0 miles), a nice small town, we saw signs advertising Fred's Diner and that recalled we were hungry. We stopped at the Diner, it was along the right side of the road, and we had one of the best steak dinners we ever ate. How our mouths water *now* when we think of it!

One mile past Afton (200.0 miles) is a small gravel bank 50 feet to the left of the road. We decided to stop but found nothing extra in the 200x50x10 foot high working. We found the usual brown limonite stains on rock, some grayish pebbles of chert, and some brown pebbles of jasper. Tiny crinoid stems and a large fossil shell were also found.

Unadilla, (215.0 miles) a very nice town in Otsego County, intrigued us greatly and we would have stopped had we known anyone there but as we did not we kept on. Since then one of our members, Mr. Arthur E. Young, has moved there from Ithaca, N. Y.

A few miles past Unadilla a stone quarry almost bordered the road on the left (219.4 miles). We stopped to have a "look-see." The quarry was 300x100 feet and 20 feet high at the face. The rock was a horizontally bedded red sandstone with a little gray sandstone at the bottom. Some red shale was also present. *Aragonite*, as grayish-white crusts on sandstone, was the only mineral seen. A number of good specimens of worm burrows in shale were seen and collected. The little hamlet of Wells Bridge (220.8 miles) in southwestern Otsego County, is the nearest place to the quarry.

Oneonta, a small city of about 14,000 population, was soon reached (232.0 miles). A noted normal school is located here. We turned right, in the city, on N. Y. Route 28 and headed southeast for Kingston.

We passed though Delhi (254.4 miles) and Andes 268.7 miles), both nice towns, but saw no rock outcrops along the way.

Another quarry, 100 feet to the right, was spotted and we stopped to examine it. We found it to be 200x100x75 feet high at the face. The rock was red and gray horizontally bedded sandstone and the only mineral noted was *aragonite* as grayish incrustations on gray sandstone. Mileage to the quarry, 275.2.

Dunraven (276.5 miles) is the nearest town to the quarry and is in southeastern Delaware County.

When we reached Margaretville, (280.3), a fair sized village in Delaware County, the writer was in familiar territory as from there on to Kingston he had traversed many times back in 1921-22 when employed as an engineer during the construction of Shandaken Tunnel for the New York City water supply. In Margaretville there used to be a covered bridge over the East Branch of the Delaware River. But it was gone! In its place was a nice concrete bridge.

Allaben (298.0 miles) is a little hamlet in Ulster County, the former headquarters of the Shandaken Tunnel engineers and contractors. Many abandoned sandstone quarries are in the neighborhood which the writer had often visited but there was no time now to do this again. Allaben has the distinction in having two names—Allaben is its post office name and Shandaken its railroad name. Both buildings (post office and railroad station) are only a block apart!

In Kingston, which we reached about 6:00 p.m., and it was quite dark, we had a little unpleasant experience. Just as we were about to go over the big bridge which spans the Rondout Creek, four or five policemen with flashlights and guns in hand, sprang at us from

nowhere and ordered us to stop. So unexpected was their appearance that we were greatly startled. The doors of our car was flung open on both sides, lights flashed in our faces, guns pressed against our bodies, while questions such as "where did you come from?", "where are you going?", "what are your names?" were hurled at us. What or for whom they were looking we never learned because, before we had a chance to answer even one question, we were told to go on. We did. On the other side of the bridge were three or four policemen, all on guard. We did not stop to ask them any questions but kept on going.

From Kingston we followed the west bank of the Hudson River which we crossed via the Bear Mountain Bridge, reaching Peekskill at 9:15 p.m. (378.0 miles).

Although we failed to collect any minerals of value the trip was a grand success from the geological point of view. The rock outcrops and sandstone quarries seen and examined were of considerable interest.

Precious Serpentine Locality In Arizona

Not long ago Mr. and Mrs. W. M. Dickinson, of Shreveport, La., made a trip to Arizona, stopping at many points enroute to collect minerals. One interesting locality was in southeastern Arizona (in central Gila County), where good specimens of grayish-green precious serpentine were found with thin veins of chrysotile asbestus running through it.

The locality is on U. S. Highway 60 from Show Low to Globe—a beautiful drive. Just after the Salt River bridge was crossed (going southwest towards Globe), they got out of the car to investigate some interesting-looking rocks that had been blasted from a nearby cut. The rocks were limestone and in them was the serpentine. The serpentine takes a beautiful polish.

Three Minerals from New Brighton, Penn.

New Brighton is a little city of 10,000 pop. in N. E. Beaver County of western Pennsylvania. Near the city, three interesting minerals have been found in sedimentary rocks. These minerals are: barite, in white laminated masses in nodules of siderite; pickeringite, in white botryoidal efflorescent masses; and siderite, in dark brown nodules and concretions.

A Montana Corundum Mine

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sponsored a trip of the Montana Society of Natural and Earth Sciences (commonly known as the Rock Club) to the mine on a field trip. All members secured nice specimens and also obtained good pictures of the mine.

Bozeman and Anceny Mines

The Bozeman Corundum Co. mine, on the Blankenship Ranch, is from 8 to 10 miles north of the Montana Corundum Co. mine. The Anceny Corundum Company mine is 5 miles west of the Montana Corundum Co. mine. The Anceny mine was operated by the Anceny Ranch.

Another corundum prospect is located westerly on Cherry Creek but only a little development has been done.

Data from Bozeman Chamber of Commerce:

Bureau of mines has spent $17,000.

Grazing Department has spent $8,000 for an unsurfaced road.

O'Brian, Engineer in charge at present.

Montana Power Co. is to construct a power line to mine site.

This deposit is reported to be the largest known in the Western Hemisphere.

Since preparing the above, the American Abrasive Co., of Westfield, Mass., has secured title to the mine and a 90-foot shaft has been sunk somewhat to the west of the old shaft.

It is proposed by the American Abrasive Company to incorporate under Montana Laws and spend $100,000 for a mill and other buildings to operate the mine.

COLLECTING UNDER ARMED GUARD

By DR. A. C. HAWKINS

Prior to the year 1943 the City of New York began the excavation of a new subway tunnel between the lower end of the city and adjacent Brooklyn, to be known as the Brooklyn-Battery Tunnel. The work had proceeded only a part of the way when the war put a temporary stop to it. Sole surface evidence of the existence of the excavation which extends under the waters of the harbor is a group of temporary buildings and a large rock-dump of deltaic appearance, located around the partly demolished aquarium building, which was on the site of the old Castle Garden, close to the lower end of busy Broadway. The excavated rock is Manhattan mica-schist intruded by pegmatite, which naturally offers a good collecting-ground.

Being of easy access by main transportation lines on the island, and also in plain view of certain mineral-hungry commuters who daily travel on ferries across the pleasant waters of the lower Hudson and Upper Bay, it was presently visited successfully by some of them. For in those days the property was under the jurisdiction of a New York City Tunnel Authority and ready permission was obtained to pass thru one of the several gates in the high green board fence which surrounds the area.

But in mid-July of 1943, when this humble but persistent collector approached the entrance, the place had a very different look. While everything inside the fence maintained its habitual appearance of the most lonely, quiet and forsaken spot in a great city, the outside of the fence simply teemed with handsome young men in white uniforms of the U. S. Coast Guard. The parking area held numerous military cars including jeeps. Addressing myself to a city policeman, I said that it was my earnest and heartfelt desire to go inside the fence. Being quite used to meeting almost any situation without looking any more than slightly surprised, he advised that the matter was entirely in the hands of the Coast Guard. He called to one of the men in white, to whom the desirability of collecting on the dump was briefly outlined. This lad did not show any particular appreciation of the idea of mineral collecting and was not aware that there was any pile of rocks behind the fence anyhow. He said that the "S. P." (member of the Shore Police) must be consulted. The latter was found, fortunately, to be much more conversant with mineralogical ideas; he took me into the presence of a non-commissioned officer in the entry hall of the Coast Guard building. This latter young fellow seemed very sympathetic and appreciative of my efforts to collect something from New York for purposes of exchange with other people in Denver and other far-away places. And what was most remarkable was the fact that the more I explained that the matter had no significance in winning the war, and was of no real importance whatever, the more interest the project seemed to arouse. "This is a restricted area; no civilians whatever are allowed inside the fence; but have you any identification?" Membership cards in the New York and other mineral societies, and the American Legion, were produced, together with proof that I was engaged in important war work along mineralogical lines. These seemed to give complete satisfaction. This matter, he said, was for the "O. D." to decide. And forthwith I was ushered into the presence of the said Officer of the Day, a pleasant young Army captain, who, with several others of a similar rank, occupied the inner sanctum. Without hesitation he granted me permission to go inside the fence and to visit the rock-pile, but stipulated that I must be accompanied by a special "S. P.", equipped with side-arms sufficient to blast me into the harbor in case of actual or suspected misdemeanor. Time limit allowed for collecting was 30 minutes, and smoking within the area was most distinctly taboo. To this I could not help replying (mentally) that

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The Amateur Lapidary

GRINDING WITH POWER MACHINERY

By ARTHUR E. YOUNG, Unadilla, N. Y.

The amateur who builds or buys powered equipment for grinding his "precious" stones does so for two reasons: first, to get the job done faster, and second, to reduce the elbow grease required. Lapidary processes are, perhaps, unique in that there are many possible variations which will produce good results. Also it is a strange fact that the methods and equipment which one person finds most satisfactory will produce only poor results when used by another. Consequently one may be well repaid for the effort of experimenting with the various suggestions to be gleaned from many previous issues of *ROCKS and MINERALS* as well as several available books on the subject.

There are two general types of power driven equipment, briefly described as the horizontal spindle, and the vertical spindle. Each requires rather different techniques in its operation.

Horizontal spindle machine

The simplest machine can be made from a ¼ H P motor and an ordinary polishing spindle. This type of machine is quite fully described by Baxter in "Jewelry, Gem Cutting, and Metal Craft" and in issues of *ROCKS and MINERALS*.

In setting up this machine it is very convenient to use a spindle having a cone socket and interchangeable arbors. Then each wheel or drum can be permanently mounted on individual arbors and will always be perfectly centered.

I prefer to run all work against the outside edge, or periphery of the wheels. This necessitates three or four hard wood drums 6 inches in diameter and 3 inches thick. Two of these are covered with strips of carborundum cloth #220 and #320, wet or dry type. A strip of felt or flannel cloth under the finer grit helps to prevent scratches and produces a semi-polish which works up quickly to a very fine surface on the buffer. The buffer is made by cementing a strip of thick felt around one of the wooden drums. The fourth drum can be made into a leather-surfaced buffer with grooves for special purposes. I run the spindle at a speed of 1200 rpm, using the same speed for all of the wheels as well as the mud saw. I find that this speed gives the most rapid cutting (on a 6" wheel) while avoiding heating of the stone.

I start the grinding on cabochons by roughly shaping the stone on a very rough grinding wheel (#80 grit, clay bonded carborundum), forming at the same time the flat side or "back" of the cabochon. Then I touch up the flat side on a #180 grit grinding wheel and then on the #220 cloth drum. This is as far as I go with the flat unless the stone is for sale. If the stone is mounted for display by cementing onto a card, the cement sticks better if the flat is not polished.

After cementing the stone onto the dop, I do the final shaping on the #180 grinder, then proceed to the cloth drums. All this is done with water running on the wheels and cloth drums. Many people recommend running the work dry on carborundum cloth. This is OK if you are careful to avoid heating the stone. But I believe the cloth cuts faster when used wet, and the work proceeds faster because it can be run against the drum more continuously. Of course it is essential to make the drums from well seasoned wood if they are to be used with water. Polishing is done on the felt covered drum with alumina and water applied with a small paint brush.

In running a mud saw at this high speed it is necessary to feed the abrasive mixture continuously onto the edge of the saw directly over the cut. For this purpose I formed a piece of tin into a triangular trough which I supported with the narrow end very close to the edge of the blade and immediately over

the stone. By properly tilting this trough the abrasive can be made to flow slowly out of the narrow end while it is fed periodically onto the wider portion with a tin scoop or old spoon. The mixture is #180 grit emery mixed into a thin paste with clay.

Vertical spindle machine

The vertical spindle machine, with laps revolving in a horizontal plane, is much more versatile and faster for most work except sawing, for which it is absolutely useless. The advantages of this type of machine for grinding large flat surfaces is evident, and it is the only machine on which facetting can be done with any accuracy. The great advantage of this type of machine in grinding either flats or cabochons lies in the use of loose grit abrasives. When properly handled, loose grit on a cast iron or steel wheel cuts more rapidly than an abrasive wheel, but is considerably more messy.

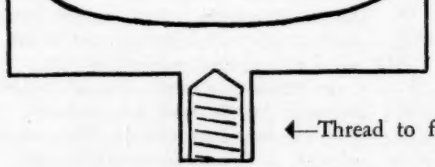
A tool turned from a piece of cast iron, threaded to fit the end of the spindle, and having a cross section as shown on the sketch is necessary to grind the curved surfaces of cabochons. You will note that the tool is only slightly curved at the center and more sharply curved toward the rim. With this arrangement the differently curved parts of the cabochon can be formed by grinding at different places on the tool.

Two similarly shaped tools made of some very hard wood, such as maple, beech, or hickory, are used with the finer grades of abrasive. The spindle is run at 1400 rpm, and grinding is done on the cast iron tool with #120 emery first and then with #180 emery after carefully washing out all the coarser material. Then the work is run on one wood tool with #220 carborundum and on the other wood tool with #320 carborundum. Always use a different wood tool for each separate grit size, and be extremely careful not to allow any coarse grains to contaminate the one used for the finest. A flat felt-faced lap is used for polishing both flat and curved surfaces. A cup lap similar to those described above might be faced with felt and used for polishing with some advantage in speed.

You will note that I use emery on the iron tool and carborundum on the wooden tools. I have found that carborundum grain used on a metal tool crushes quickly into finer material and "wears out". Emery, on the other hand, is much tougher and wears longer when used on a metal tool. However, the carborundum grains are sharper and when used on a wooden tool they press into the wood, forming a fast cutting surface which does not wear out quickly.

Agate marbles can be formed by grinding in a cup lap having a hemispherical depression about ¾ to 1 inch in diameter. To insure roundness the marble must be turned about rapidly as it is being ground. It is then run on the wooden laps just as a cabochon, and polished.

When sawing agate nodules, I have



Lap for grinding cabochons.
CROSS SECTION

Lap for grinding marbles.
CROSS SECTION

found that they frequently have a large flaw thru the middle. This is especially true of any which have been exposed to frost and weathering, such as the Lake Superior agates. Much disappointment can be avoided by candling the nodules before sawing. This is done by cutting a 2 inch hole in a large piece of cardboard. This is set up with a bright light (100 watt clear bulb) just behind the hole. If a nodule is held against the hole in the card and viewed from the side, you can easily see the deep flaws which can be marked with a pencil. Wetting the stone helps you to see deep into the interior. If the stone is then placed on a board or bench with a cold chisel over the marked flaw, a smart tap with a hammer will break it right along the flaw. Thus the nodule is reduced to smaller pieces, many of which can be ground directly; and if the larger pieces do need to be sawed you can be sure the slices will not be ruined by large cracks across them. Nodules up to 4 inches across can usually be candled, and some larger ones, if they are quite translucent.

Serpentine, gypsum, malachite, and other soft stones (up to hardness 4) can be clamped or cemented to the flat lap of your machine and turned with a hardened steel cutter just as if they were blocks of wood. A very firm steady rest must be used, and the tool will need frequent resharpening. An old worn-out file makes a very good cutter for this purpose. The spindle speed should be around 300 to 400 rpm, and water should be kept running on the work. Ash trays, small vases, and bowls may be fashioned.

Do not be afraid to try new ideas on your machine, different spindle speeds, different abrasives, different kinds of laps. As a manufacturer of grinding machinery remarked to me: "I have seen some mighty queer things tried. There do not seem to be any general rules for this work, anything goes that works." We grind stones for the fun that is in it, and for me part of the fun is in trying something new.

Wedding Bells Ring Out for Two Members of the R.&M.A.

The following item will be of considerable interest to many of our readers, though we are sorry it did not reach us a few months ago so that it could have appeared in an earlier issue of *Rocks and Minerals.*

Married June 16th, 1944, in Riverside, California, Mary Isabel Westcott and Cpl. Walter Harold Printz, of the U. S. Army, formerly of The Yaquina Gem Shop of Newport, Oregon, now stationed at March Field, Riverside, California, after 10 months duty in the Canal Zone.

Mrs. Printz, a mineral collector of long standing and the author of numerous articles on mineralogy and crystallography, is supervisor of Dental Health Education in the city school of Fresno, California.

Both Cpl. and Mrs. Printz have been members of the Rocks and Minerals Association for a number of years.

Collecting Under Armed Guard

(*Continued from page* 64)

they might give me the sentry who stood outside the door with a shiny bayonet. The "S. P." was a lad from Joplin, Missouri, who, it turned out, was familiar with the specimens of lead and zinc ores from that vicinity, and with stalactites and caves. He followed me around closely and showed very active interest in specimens of muscovite, biotite, orthoclase, garnet, epidote, stilbite, and chabazite which were gathered in. Some of the chabazite crystals are especially interesting from the crystallographic viewpoint, since they show both the first and second order rhombohedrons and the basal plane.

It is interesting to see how a realization of the interest and importance of minerals is gradually seeping into the consciousness of a typical cross-section of the American public. And who can tell what adventures we may encounter in time of war?

Club and Society Notes

Gala Christmas Party For L. A. M. S.

The December meeting of the Los Angeles Mineralogical Society was another of their memorable Christmas parties, attended by just over 100 members and guests. The Society was privileged to have as guests President and Mrs. E. F. Carlson, of the Long Beach Mineral Society; President and Mrs. William S. Oke of Pacific Mineral Society, Inc.; President and Mrs. Cassius Ferguson and President-elect and Mrs. Eric Stone of San Fernando Valley Mineral & Gem Society; President and Mrs. Sam Boase of the Southwest Mineralogists; President Charles S. Knowlton and Secretary Lee Seabridge of the West Coast Mineral Society. A last-minute business engagement prevented President Jack Streeter of the Mineralogical Society of Southern California from attending. It is believed that more sociability of this sort would stimulate closer cooperation between the societies. The party was held at the West Ebell Clubhouse on Saturday night, December 16th.

A pre-opening mineral identification contest "for experts only" resulted in much chagrin on the part of said experts and amusement for onlookers, when it developed that all of the specimens were Willemite, as no one identified them.

A short talk by Gordon Funk, describing a field trip to the White Caps Mine at Manhattan, Nevada, made members wish trips of this sort were possible now.

The announcement that Dr. Thomas Clements of the U.S.C. had accepted the candidacy for this Society of the presidency of the California Federation of Mineralogical Societies, was enthusiastically received, indicating the ardent support of the members.

Following the unveiling of the beautiful Christmas tree, several accordion solos by little Miss McPheeters (of the San Fernando Society) were much enjoyed and group singing of Christmas Carols gave the members a chance to stretch their vocal chords and attain the proper mood for the arrival of Santa Claus, in the person of O. C. Smith, whose distribution of gifts was supervised by Mrs. Santa Claus (Melba Ferguson), to the accompaniment of an uproar of excited laughter and hearty appreciation of the many beautiful mineral specimens found in Santa's pack, each member and guest being favored.

The reading of a letter from member Bill Harriman, thanking the Society for its gift to the Patients' Christmas Fund at Rancho Los Amigos (L. A. County Home), of which Bill is Director, inspired similar action this year and with a little help from the Treasury of the Society, a purse of fifty dollars was contributed to help make Christmas merry at the Rancho.

Hospitality Chairman Melba Ferguson and her committee had decorated the banquet hall and tables, where ice cream, delicious homemade cakes and coffee supplied a fitting climax to a thoroughly enjoyable evening.

(Submitted by Howard Paget, Publicity Chairman for the Society).

Los Angeles Lapidary Society Meets

The December meeting of the L. A. Lapidary Society was one of the most enjoyable affairs of the year. Over 100 members and guests enjoyed a turkey dinner at the Friday Morning Club house, Monday, December 4th. According to custom, at this meeting there was an exchange of surprise gifts consisting of polished rocks of all types. These, beautifully wrapped in attractive Christmas boxes, were displayed on tables. After a short business meeting our president, Mr. Willis, turned the meeting over to the program chairman, Mr. Loren Mitchell, who explained the method of drawing. The letters of the alphabet were put into a box and as they were drawn those members whose names began with the corresponding letter drawn came up to the table and picked out a box. When all the boxes were opened, the stones were placed on the tables and were admired by all the members who passed around the tables. The gifts were of wide variety and size, ranging from a beautifully faceted gem to a 4-inch cube Death Valley Onyx. Jewelry was much in evidence and all types and kinds of polished rock were found on every table.

In all, it was a happy occasion.

Charles G. Schweitzer, *Reporter.*

Junior Mineral Exchange

This is a mineral club for boys, 13 to 17 years of age, whose headquarters are in Revere, Mass., although it has members in many states. The officers for 1945 are as follows:

President—Donald Rich, of Torrington, Conn.

Secretary-Editor—Jerome Bisenberg, of Revere, Mass.

Treasurer—Arnold Hampson, of W. Barrington, R. I.

The club issues its own bulletin, have held a number of field trips, and is quite a lively organization. For further particulars apply to the Secretary, Jerome Eisenberg, 77 Victoria St., Revere 51, Mass.

Worcester Mineral Club

On Nov. 21st, 1944, a small group of Worcester and Worcester County amateur mineral collectors met at the Worchester Natural History Society Museum, 12 State St., Worchester, Mass., and formed the Worchester Mineral Club.

The following officers were elected:

President—Raymond G. Newman, of Worcester.

Vice-Pres.—Gustaf H. Fyhr, of Worcester.

Sec.-Treas.—Miss Susan G. Ayres, of Worcester.

Committee Chairmen:

John H. Bodrick, of Clinton.

Joseph F. Shea, of Clinton.

Meetings, to start at 8:00 P.M., are scheduled to be held on the first and third Tuesdays of each month—except Jan. 2nd, 1945. Collectors, within attending distance, will be welcomed.

Meetings have been planned to be both instructive and social, featuring either a brief talk by one of the Club Members, or an outside speaker, accompanied whenever possible by motion pictures. General discussion of the topic is then encouraged. Swapping and inspection of specimens follows. Field work will be taken up in the spring.

Susan G. Ayres, *Sec.*

. . . With Our Dealers . . .

The Yellowstone Lapidary, of Miles City, Mont., specialize in agates and they have a huge stock on hand. Just read their ad to be convinced.

Another assortment of excellent specimens are advertised this month by the Wiener Mineral Co., of Tucson, Ariz. This fine company handles nothing but the choicest of specimens.

The *Mineral Bulletin,* published by W. Scott Lewis, of Hollywood, Calif., has a wide circulation. It is interesting and informative—students bind it for reference and its editorials are widely reprinted. Rush in your subscription should your name fail to appear on its mailing list.

Mammoth Mine Minerals are featured this month by Schortmann's Minerals of Easthampton, Mass. We bet they will all be sold out before the month is half over because on Labor Day a big fire at the mine may close the workings permanently. Incidently don't forget the Annual Exhibition and Sale the Schortmanns will hold on March 16th and 17th.

Choice western minerals—many from Utah and Colorado—will surely intrigue our readers this month. You will find them advertised by Marvin's Rock Shop, of Durango, Colo.

C. L. Brock, Manager of the American Mineral Exchange, Houston, Texas, is retiring as a dealer and offering his business for sale. Here is an opportunity for a wide-awake collector to purchase a well-established mineral business.

Some fine minerals from an old collection are continued this month by Hugh A. Ford, of Cambridge, Mass. Mr. Ford is widely known among Eastern mineralogical circles and his collection has an enviable reputation for unusually fine specimens.

L. D. VanCleave, of Joplin, Mo., has a get-acquainted sale in this issue and you surely should take advantage of it. Read his ad for more particulars.

Books—magazines—and a huge assortment of lapidary equipment are the features this month of Warner & Grieger, of Pasadena, Calif. This fine company must carry a huge stock to fill orders from our many readers.

Many thanks to collectors:—is the cordial greeting of Chas. O. Fernquist, of Spokane, Wash.. to all collectors who have taken an interest in the Seeber Collection of Michigan Copper County minerals he recently purchased. Our readers simply swamped him with orders!

Colorado barites were the best sellers during 1944 for Robert Roots, of Denver, Colo. If you failed to purchase a specimen, he still has a few nice ones left—but don't wait too long!

Branham's Jade has always been popular with collectors—it is even more so today. Get a popular specimen from Allan Branham, of Lander, Wyo.

Superb specimens of English fluorites—old specimens but the finest they have had for years—are now on sale by Ward's Natural Science Est., Inc., of Rochester, N. Y. Fine old specimens always intrigue active collectors!

A. L. Jarvis, of Watsonville, Calif., is featuring four choice specimens from his state. Don't show any partiality—order them all!

Another beauty from the Big Bend!—It's a mineral and not a girl! Ask Frank Duncan and Daughter, of Terlingue, Texas, if we are not right. And if you want further proof, send them an order and then see what you get!

The Colorado Gem Co., of Bayfield, Colo., the founders of Gem Village, have a large stock of cutting material always on hand. Your inquiries are welcomed.

A new advertiser this month is Pohndorf's, of Denver, Colo. This is a grand old firm which has been selling fine minerals for over 35 years. We are sure their first ad will create considerable interest among our readers.

E. Mitchell Gunnell, of Denver, Colo., is in the market for choice crystallized minerals. If any reader has such fine material for sale, or exchange, get in touch with him.

There is always something new in Texas! At any rate Jno. B. Litsey, of Dallas, Texas, has another Texas specialty for our readers. You don't have to take our word for it—the best proof is to order a specimen and see for yourself.

The cuprite minerals from the Bigham mine in Pennsylvania are very attractive and take a beautiful polish. Oh, yes, W. T. Baxter, of Bethesda, Md., has a large stock of them.

W. Dart, of Goldfield, Nev., has about 500 different Nevada minerals in stock. He can fill many orders for minerals of his state.

J. L. Davis, of Hot Springs, Ark., has an idea that should appeal to gem cutters. Look his ad up!

Another dealer who is in the market for good minerals is the West Coast Mineral Co., of La Habra, Calif. What can you supply?

Four sets, each consisting of six fine Arkansas minerals, are Winter Specials of H. E. Powell Co., of Little Rock, Ark.

James W. Riley, of Springfield, Ohio, also has a February Special—a surprise package. We will say nothing more about it as this is a surprise!

A. J. Harstad, of Helena, Mont., is continuing in this issue his New Streamline Service. Surely you are taking advantage of it!

Thunder Eggs—nice slices of them—are offered by a new advertiser, Bill Lundstrum, of Spokane, Wash. Better order a slice or two!

Bibliographical Notes

The Mineralogy of the Tin Mines of Cerro de Llallagua, Bolivia; by Samuel G. Gordon.

The tin mines of Llallagua, Bolivia, are famous for their large number of interesting minerals, many of which have been distributed among collectors and museums throughout the world. A number of interesting articles on these minerals have appeared in various journals but the present paper is the most complete known. The author, who is Associate Curator of Mineralogy at the Philadelphia Academy of Natural Sciences (also a member of the R. & M. A.), has made a number of trips to Llallagua and spent many days there, collecting and examining huge quantities of minerals. This paper is, therefore, a complete report on the minerals known from the locality.

Our congratulations are extended to Mr. Gordon on his very interesting and most valuable report on one of the world's great mineral localities.

This excellent report covers over 60 minerals, contains 82 figures, and 13 plates. It was published on Dec. 20, 1944, by the Philadelphia Academy of Natural Sciences, Philadelphia, Penn., in the *Proceedings of the Academy of Natural Sciences of Philadelphia,* Vol. XCVI, 1944, pages 279-359.

Geology and Ore Deposits of the Superior Mining Area, Arizona, by M. N. Short, F. W. Galbraith, E. N. Harshman, T. H. Kuhn, and Eldred D. Wilson.

This is an interesting report on a mining area whose principal workings are the well-known copper mines of the Magma Copper Co.

The report contains 159 pages, 13 figures, and 15 plates. Issued by the Arizona Bureau of Mines, Tucson, Ariz., as Geol. Series No. 16, Bull. No. 151. Price $1.85 (free to residents of Arizona).

Arizona Nonmetallics, by Eldred D. Wilson.

Although Arizona is famous for its metal mines it has also many valuable nonmetallic deposits. This paper reviews past productions and present operations.

The report contains 58 pages and is issued by the Arizona Bureau of Mines, Tucson, Ariz., as Min. Tech. Series No. 41, Bull. No. 152. Price 30c (free to residents of Arizona).

Annoted List of Publications of the Department of Mines of the Province of Quebec—1883-1944.

Most of the publications listed are out of print but can be consulted in libraries, museums, and other institutions. 39 pages.

Issued by the Bureau of Mines, Quebec, Canada.